Attorney Docket No. 66011-0120 **PATENTS**
Serial No. 09/505,898

REMARKS

Claims 44-47, 54-56, 60-65, 72-81, and 88 - 92 are pending in the application. Favorable reconsideration is respectfully requested in light of the following Remarks. Applicants thank the Examiner for acknowledgement of the previously submitted formal drawings and withdrawal of the previous rejections under 35 U.S.C. §103.

I. Formal Matters

Applicants acknowledge that the Office Action indicates that Claims 48-53, 57-59, 66-71, 82-87, and 93-105 are directed to a non-elected invention with Claim 44 being a generic linking claim, and upon allowance of Claim 44, the restriction requirement will be withdrawn and any claim depending from or otherwise including all the limitations of Claim 44 will be entitled to examination in the instant application.

II. Rejection of Claims 44-46, 54-56, 60-65, 72–81, and 88-92 under 35 U.S.C. §103(a)

The Office Action rejects Claims 44-46, 54-56, 60-65, 72 – 81, and 88-92 under 35 U.S.C. §103(a) as being unpatentable over Oprandy et al. (Journal of Clinical Microbiology, 1990, hereinafter "Oprandy"), in view of Huang et al. (U.S. Patent No. 5,712,172, hereinafter "Huang"), WHO Bulletin (Bulletin of World Health Organization, 1996, hereinafter "the WHO Bulletin") and Snowden et al. (Journal of Immunological Methods, 1991, hereinafter "Snowden). The rejection is respectfully traversed.

As indicated in the previous Office Action, Oprandy does not disclose or teach the step of applying the sample to a dipstick device for the detection of the analyte, as recited in Claim 44. However, in order to overcome this shortcoming in Oprandy, the present Office Action asserts that it would have been obvious to modify Oprandy with teachings of Huang, the WHO Bulletin, and Snowden to meet the claimed invention. Applicants disagree with this assertion.

The combination of the cited references does not disclose, teach or suggest all the limitations of the claimed invention. Claim 44 specifies, *inter alia*, a method for analyzing an arthropod sample for the presence of one or more analytes associated with an arthropod-

carried agent that causes a disease in mammals including the step of detecting the presence of the detectable analyte-specific reagent indicating the presence of the analyte in the sample, wherein a plurality of detectable analyte-specific reagents for a plurality of arthropod-carried agents are employed and the support comprises a plurality of capture reagents immobilized onto a plurality of different detection areas. These features of the invention are simply not mentioned or suggested in the applied art, and the Office Action fails to establish a *prima facie* case of obviousness. *See MPEP §2143.*

Even if the combination of the applied art disclosed all the claim limitations, Applicants assert that there is no motivation to combine Oprandy with Huang, the WHO Bulletin, and Snowden to meet the claimed invention. Oprandy is directed to a dot-blot immunobinding assay to detect arthropod-borne agents. The system involves a two-step process that solubilizes antigen and microfilters debris and immobilizes target molecules onto a single phase. Arthropod vectors are homogenized in sodium dodecyl sulfate (SDS) and then spot filtered with pressure through a two-membrane sandwich. The first membrane is a nonbinding hydrophilic membrane and serves to exclude debris. The second membrane is a high-protein-binding-capacity hydrophobic polyvinylidene difluoride (PVDF). *See Page 1701, first column, second paragraph.*

In addition, Oprandy teaches that the use of brittle nitrocellulose in membrane-based tests is undesirable because of the possibility of high backgrounds. *See Page 1701, first column, first paragraph.* A prior art reference may be considered to teach away when "a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553, 31 USPQ 2d 1130, 1131 (Fed. Cir. 1994). Thus, Oprandy teaches away from the use of nitrocellulose in membrane-based tests.

Huang is directed to a one step lateral flow immunochromatographic assay device. The device comprises a series of porous material pieces 2, preferably nitrocellulose material, and porous paper material 3, 4 that are laminated to an elongated strip of semi-rigid material 1, such as vinyl. *See col. 5, 12-18; col. 8, lines 4-7; col. 9, lines 43-45; col. 10, lines 43-48.* In Huang, it is critical that the device has adequate mechanical strength for the device to properly function. *See col. 10, lines 11-16.* To this end, Huang teaches that the mechanical

strength or rigidity of the device be measured two different ways with the result being that the less the device bends, the more favorable the results. *See Figs. 6a, 6b; col. 9, line 62-col. 10, line 11.* In Huang, the less the device bends, the more favorable the results.

Because Huang teaches the use of nitrocellulose for the porous material to achieve adequate mechanical strength critical for providing favorable test results and Oprandy teaches away from the use of nitrocellulose because of the high backgrounds, one of ordinary skill in the art at the time the invention was made would not be motivated to combine the teachings of Oprandy and Huang to meet the claimed invention. Applicants respectfully disagree with the interpretation of *In re Lamerti and Konort* and *In re Gurley* as applied to the present case. Oprandy does not state that use of nitrocellulose is "somewhat inferior" to some other product, or the use of nitrocellulose is a "nonpreferred embodiment." Instead, the clear implication of Oprandy's criticism to one of ordinary skill is that nitrocellulose is not usable at least with the features of Oprandy's test due to high background characteristics of nitrocellulose. In this light, Oprandy teaches away from any combination of its disclosure with Huang and undercuts the proposition that there is motivation in the references themselves to combine them to arrive at the present invention.

The deficits of Oprandy and Huang are not cured by combination with the WHO Bulletin. The WHO Bulletin is directed to a dipstick assay for the detection of a malarial antigen found in the blood of an infected patient. The WHO Bulletin does not teach the detection of a mosquito stage antigen from a mosquito sample. Thus, one of ordinary skill in the art would not be motivated to combine the teaching of the WHO Bulletin directed to a dipstick assay for the detection of a malarial antigen in a *blood sample* with the teaching of Oprandy directed to a dot-blot immunobinding assay of a *mosquito sample* and with the teaching of Huang directed to a lateral flow device for the detection of an analyte in a *urine sample.*

The deficits of the three previous references are also not cured by combination with Snowden. Snowden reports only the results of a "pilot study" of a dipstick colloidal dye immunoassay for proposed antigen detection. Among other differences from the present invention, Snowden discloses only the use of its assay to detect antigens consisting of human or chicken immunoglobulins. Unlike the present invention, Snowden does not teach or disclose a method for analyzing an arthropod sample for the presence of one or more analytes

associated with an arthropod-carried agent that causes a disease in mammals. Nor is there any motivation in the reference itself to do so.

Applicants also respectfully disagree with the remaining assertions concerning motivation and expectations of success arising in connection with the cited references. For example, without limitation, nowhere do the cited references disclose, teach or motivate the elements of the claimed invention which overcome the challenges and diversity in testing arthropod samples, for example, as collected or processed, as the present invention does.

In view of the foregoing, it is respectfully submitted there is no motivation in the applied references or in the general knowledge of one of ordinary skill in the art at the time the invention was made to combine the teachings of the applied art to meet the claimed invention. Because there is no motivation in the applied references or in the general knowledge of one of ordinary skill in the art at the time the invention was made, the Office Action fails to meet its burden of showing obviousness under 35 U.S.C. §103.

Even if there were proper motivation to combine Oprandy, Huang, the WHO Bulletin and Snowden, the combination of Oprandy, Huang, the WHO Bulletin, and Snowden do not disclose all the claim limitations. Oprandy does not teach applying the sample to a dipstick device for the detection of arthropod-borne agents. In addition, Huang does not teach detecting an etiologic agent from a mosquito sample. Further, the WHO Bulletin does not teach the detection of a mosquito stage antigen from a mosquito sample. Snowden also does not teach the detection of a mosquito stage antigen from a mosquito sample. Thus, the applied art does not teach at least the step of *contacting the sample containing arthropod debris with a liquid permeable support* and at least one detectable analyte-specific reagent that binds to the analyte to form an analyte-reagent complex, as recited in Claim 44. For at least these reasons, the present Office Action fails to establish a *prima facie* case of obviousness.

In view of the foregoing, Claim 44 is allowable over the applied art, taken singly or in combination. Claims 45, 46, 54-56 and 60-62, which depend from Claim 44, are likewise allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

III. Rejection of Claims 44-46, 47, 54-56, 60-65, 72-81 and 88-92 under 35 U.S.C. §103

The Examiner rejected claims 44-46, 47, 54-56, 60-65, 72-81 and 88-92 under 35 U.S.C. §103(a) as being obvious over Oprandy et al. (Journal of Clinical Microbiology, 1990), Huang et al (U.S. Patent No. 5,712,172), WHO Bulletin (Bulletin of the World Health Organization, 1996), and Snowden et al. (Journal of Immunological Methods, 1991), in view of Rattanarithikuln et al. (American Journal of Tropical Medicine, 1996) and Sithiprasasna et al. (Annals of Tropical Medicine and Parasitology). This rejection is respectfully traversed. Applicants respectfully request that this rejection be withdrawn.

Claim 47 depends from Claim 44. Neither Rattanarithikuln nor Sithiprasasna teach or motivate the selection and use of monoclonal antibodies in the detection of different arthropod-borne disease vectors or pathogens in the method as recited in Claim 44, especially in view of the differences from ELISA assays described in one or more of the references. Thus, Rattanarithikuln and Sithiprasasna add nothing to overcome the shortcomings of Oprandy, Huang, the WHO Bulletin, and Snowden discussed in Section II above.

In view of the foregoing, Claim 47 is allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

Claim 63 recites the step of contacting the sample containing arthropod debris with a dipstick and at least one detectable analyte-specific reagent that binds to the analyte to form an analyte-reagent complex, where a plurality of detectable analyte-specific reagents for a plurality of arthropod-carried agents are employed and the support comprises a plurality of capture reagents immobilized onto a plurality of different detection areas. For at least the same reasons stated for Claim 44, Claim 63 is allowable over the applied art, taken singly or in combination. Claims 64-65 and 72-78, which depend from Claim 63, are likewise allowable over the applied art, taken singly or in combination.

Claim 79 specifies, *inter alia*, a method for analyzing an arthropod sample for the presence of one or more analytes associated with an arthropod-carried agent that causes a disease in mammals, said method comprising the step of contacting the sample containing arthropod debris with a panel assay having capture reagents immobilized onto separate areas and detectable analyte-specific reagents specific for an analyte associated with each arthropod-borne agent to which the capture reagents are directed.

It is respectfully submitted that at least these steps of the present invention are not disclosed, taught or suggested in the applied art. For at least this reason, Claim 79 is allowable over the applied art, taken singly or in combination. Claims 80-81, and 88-92, which depend from Claim 79, are likewise allowable over the applied art, taken singly or in combination.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is earnestly solicited.

Should Examiner Winkler believe anything further would be desirable in order to place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney at the telephone number listed below.

It is believed that any additional fees due with respect to this paper have already been identified. However, if any additional fees are required in connection with the filing of this paper, permission is given to charge account number 18-0013 in the name of Rader, Fishman and Grauer PLLC.

Respectfully submitted,

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